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Table of Contents

Note: References to the front-panel buttons are shown using brackets throughout this manual (e.g., "[STATUS]"). References to multiple button combinations means sequences, *not* simultaneous button presses. Press the first button, release, and press the next button.

Chapter 3 Operation: Status Mode

Chapter 4 Operation: Setup Mode

Chapter 5 Reference Information

Chapter 1
Introduction

1.1   About the DM100

The Dolby DM100 is a hand-held diagnostic tool that can monitor or generate Dolby Digital, Dolby E, and PCM bitstreams. The unit allows audio systems integrators and service engineers to quickly test the integrity and composition of these signals throughout a facility. The DM100 is intended for use in broadcast, cable, DBS, and post-production facilities, as well as DVD mastering and home theater installation.

The DM100 accepts input signals via XLR, BNC, and Toslink™ connectors. The unit identifies the format of the input signal and activates the appropriate built-in decoder. The decoded analog signal, sent to a standard 1/8-inch stereo headphone jack, can be switched to monitor any two decoded channels, while a small built-in speaker can monitor the sum of any channel pair. A front-panel LCD displays Dolby Digital and Dolby E metadata information. Six front-panel LEDs indicate critical bitstream and system status information.

A set of Dolby Digital, Dolby E, and PCM test bitstreams is stored in internal, nonvolatile RAM, and can be changed in the field via software download. The selected test bitstream is produced simultaneously on all output connectors. The unit can receive and decode an input signal while generating a test bitstream. The DM100 also features a pass-through mode that allows modification of the input signal's AES channel status bits before passing the signal to the output connectors. (The input signal can be monitored simultaneously.)

Chapter 2
Getting Started

2.1 Power

The DM100 is powered by four standard AA 1.5 V batteries or from an external 6V, 800 mA DC power supply via the power input connector. The internal batteries are disconnected when the external DC power supply is used.

Battery Installation

Push the cover as shown, and slide out.
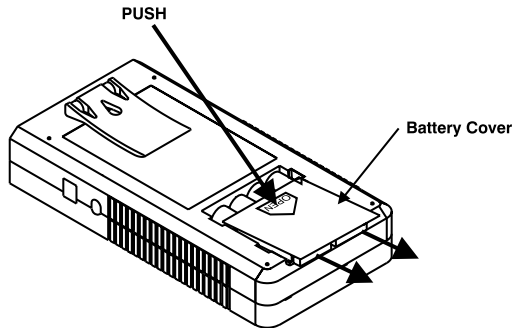
Insert four AA batteries with alternating positive terminals, and replace the cover.
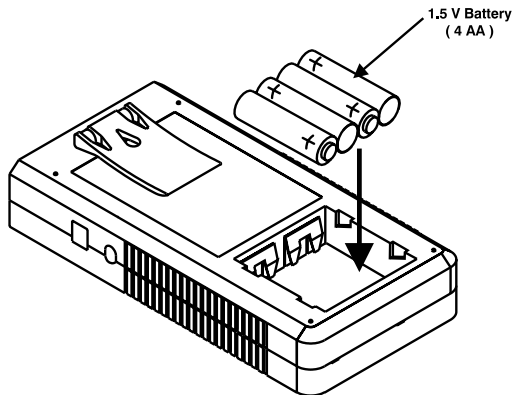
[Power] Button

To turn on the DM100, press and hold the [Power] button down for two seconds. The display reads as shown for approximately one second while a self-test diagnostic runs.

```
DO Model DM100
    Unit Name
```
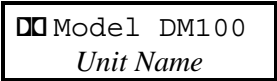
The power-on process ends with the DM100 operating in the last-used state. If the diagnostic test fails, the Error LED lights and an error message is displayed.

To turn off the DM100, press [Power] again. The display reads "Power Off," and the unit shuts off.

```
        Power Off…
```
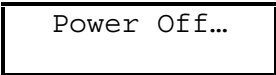
Battery Low LED

The front-panel battery LED flashes when the battery voltage drops below 4.3 V. If the battery voltage drops below 4.1 V, the DM100 display reads "Dead Battery" and the unit shuts off.


```
      Dead Battery…
```
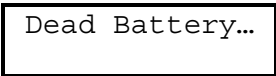
Auto-Power Off

When the DM100 is powered from the batteries (external power supply not connected), the unit can be set to turn itself off after a selectable number of minutes with no user activity (5, 10, 15, or 30 minutes). This feature can be disabled. The factory default setting is 15 minutes.

The wait time is set from the Setup menu under System Settings, Power Management. See section 4.6.

External DC Power Supply

When powered from the external power supply, the Power Management setting is ignored and the unit remains switched on. The LCD backlight and keypad backlights are also enabled, overriding the LCD Backlight setting. See section 4.6.

2.2   Rear Belt Clip/Stand

The pull-out clip on the rear of the DM100 can be used as a handy belt clip, or a stand. Raise the clip by following these two steps:

1. Lift to Release
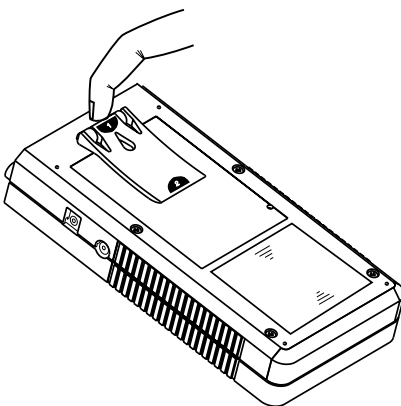
2. Pull
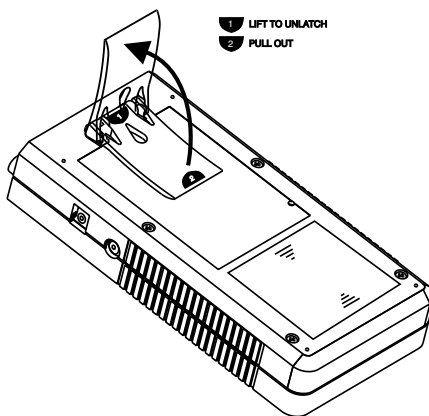
2.3   Inputs

Each input connector (XLR, BNC, or Toslink) is active when specifically selected, or, if the input selection is set to autodetect, the first input with a valid AES3 signal will become the active input. See section 4.5 for setting the input select function. See the specifications at the back of this manual for details on supported sample rates, impedances, etc.

The Digital input format can be Dolby Digital, Dolby E, or PCM.

Dolby Digital

The DM100 accepts 16- and 32-bit Dolby Digital bitstreams. It also accepts AES3 data that contains multiple Dolby Digital bitstreams (i.e., one 16-bit mode bitstream in each AES3 channel).

Dolby E

The DM100 accepts 16-, 20-, and 24-bit Dolby E bitstreams at NTSC (27.97 Hz) and PAL (25 Hz) rates.

PCM

If the input signal does not contain a header indicating that a pre-encoded bitstream is being received, the DM100 assumes the input signal is PCM audio.

Other

The DM100 also accepts other non-audio data over AES3. In this case, the LCD will indicate that data is being received and the audio output will mute.

Video

The unit can use an analog composite NTSC or PAL black burst reference video signal for signal generation, via the Ref Video RCA connector. The input is internally terminated.

2.4   Outputs

The XLR and BNC output connectors are always active. The Toslink connector is enabled when it is selected.

The digital output signal can be:

- Pass-through Dolby Digital, Dolby E, or PCM

  The output clock is locked to the digital input.

Or

- An internally generated Dolby Digital, Dolby E, or PCM test bitstream.

  The output clock can be locked to an internal 48 kHz clock, a digital input signal, or to 48 kHz derived from the video reference input. See section 4.5.

Headphone Output

The headphone output is used to monitor the decoded Dolby Digital, Dolby E, or PCM signal. Front-panel buttons adjust the headphone volume.

Speaker Output

The speaker output is used to monitor the decoded Dolby Digital, Dolby E, or PCM signal when headphones are not being used. The signal is a mono version of the headphone output. Front-panel buttons adjust the speaker volume.

2.5   Hookup

The figure shows the locations for connecting components to the DM100.

RCA F to BNC M
Part Number 70218

Ref Video In
BNC F to RCA M
Part Number 70217

Digital Out

Digital In

Toslink Cable

Power Adapter
Part Numbers: 54065 USA
54066 UK
54067 Europe
54068 Australia
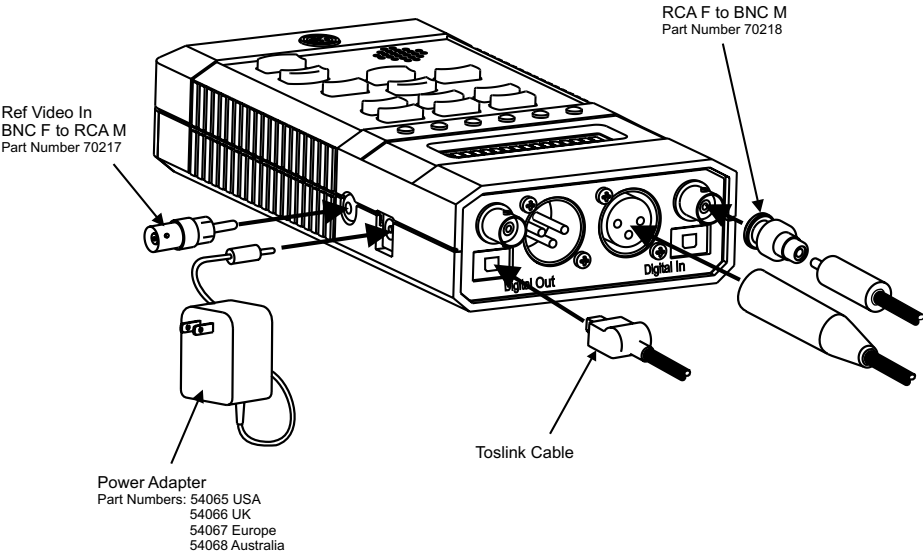
2.6   Quick Start

The DM100 is designed to be quick and intuitive to use. Follow these simple procedures to begin taking your first readings and generating your first test streams.

Making Your First Reading

1. Power up the unit.

2. Connect the input signal to the appropriate connector.

3. Press [MON]. This resets all the internal monitoring setup functions to the defaults.

The LEDs should display the signal type received, and the display will show information about the incoming signal. If you cannot see this information, press [STATUS], then use [ENTER], [ESC], and the [Up/Down] buttons to navigate through the status menus in order to view information about the incoming signal. See section 3.2.

Adjust the audio level with the dedicated [Volume] buttons.

Generating a Bitstream

1. Press [GEN] once. This will turn the generator on and output a PCM test signal.

2. To select other test streams, continue to press [GEN].

Different clock sources can be used for the generator; these can be set in the I/O Control Gen Clock Source setup menu. See section 4.5.

To read the current status of the generator, press [STATUS] and navigate using the [Down] button until "Generator ENTER to View" is displayed. Press [ENTER] to see the current settings. See section 3.2.5.

You can even connect the output of the DM100 to the input. By doing this you can listen to the test stream and view all of the streams' settings.

Chapter 3
Operation: Status Mode

After power-on, the DM100 defaults to Status mode, with the top-level main status screen displayed. Status mode is used for displaying, monitoring, and analyzing the input bitstream.

3.1 Main Status Screen

The main status screen is the top level of the status menu tree. It displays one of the following possible combinations of information. The display shown below gives a typical example:

Valid Dolby E bitstream	Dolby E
Valid 32-bit Dolby Digital bitstream	Dolby Digital
Valid 16-bit Dolby Digital packed in **left** channel	DD/PCM
Valid 16-bit Dolby Digital packed in **right** channel	PCM/DD
Two valid Dolby Digital bitstreams	DD/DD
Valid PCM bitstream	PCM
No incoming bitstream	No Input

Active Input Connector

A	Set to Autodetect
B	Set to BNC
X	Set to XLR
O	Set to Optical

```
Dolby Digital  B
3/2L    448kbps
```

The following sections describe the information displayed on the second line for each type of input data.

Dolby E

When the incoming bitstream is Dolby E, the following information will be displayed:

```
Dolby E       B
5.1+2      24bit
```

Program Configuration

5.1+2
5.1+2x1
4+4
4+2x2
4+2+2x1
4+4x1
4x2
3x2+2x1
2x2+4x1
2+6x1
8x1
5.1
4+2
4+2x1
3x2
2x2+2x1
2+4x1
6x1
4
2+2
2+2x1
4x1

Invalid Dolby E program configuration

****

Bit Depth

16bit
20bit
24bit
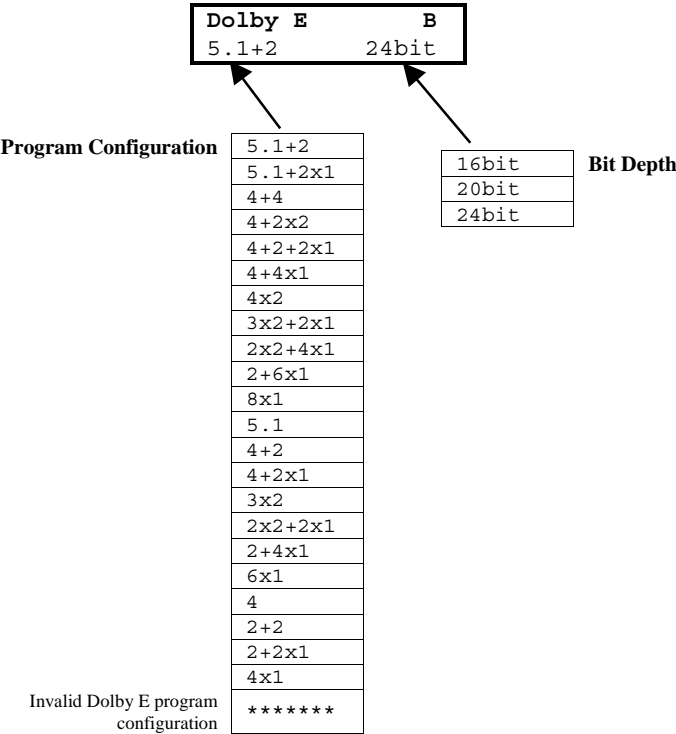
Dolby Digital

When the incoming bitstream is Dolby Digital, the following information will be displayed:

```
Dolby Digital  B
3/2L     448kbps
```

1+1
1/0
2/0
3/0
2/1
3/1
2/2
3/2
3/0L
2/1L
3/1L
2/2L
3/2L

"L" means the LFE-enabled bit is set in the bitstream

56kbps
64kbps
80kbps
96kbps
112kbps
128kbps
160kbps
192kbps
224kbps
256kbps
320kbps
384kbps
448kbps
512kbps
576kbps
640kbps
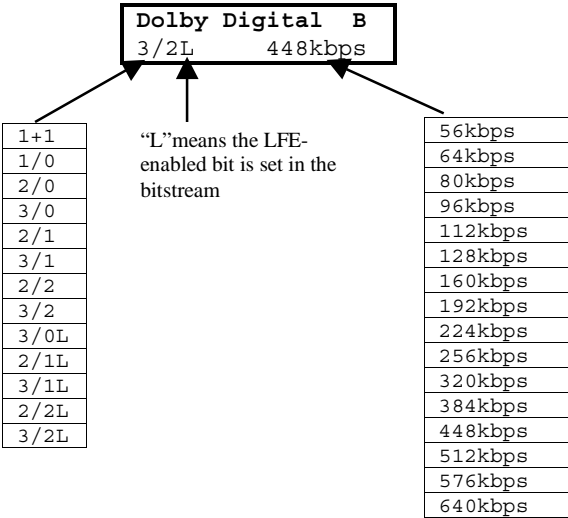
PCM

When the incoming bitstream is PCM, and the DM100 has locked to it, the following information will be displayed:
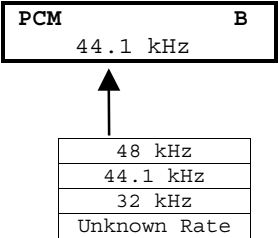
```
PCM                    B
        44.1 kHz
```

```
          48 kHz
         44.1 kHz
          32 kHz
       Unknown Rate
```

3.2   The Status Menus

From the top-level main Status display described above, you can step through the **status menus** by pressing the [Up] or [Down] button. Each menu below the top main Status display is described in the following manual sections.

```
Dolby E       A
5.1+2      24bit
```
Top level Status display
(A typical display is shown)

[Down]

```
  Dolby E MD
 ENTER to View
```
Dolby E metadata menu

[Down]

```
Dolby Digital MD
 ENTER to View
```
Dolby Digital metadata menu

[Down]

```
  AES3 Status
 ENTER to View
```
AES3 status menu

[Down]

```
  Input Level
 ENTER to View
```
Input level menu

[Down]

```
   Generator
 ENTER to View
```
Bitstream generator status display

[Down]

```
   Video Ref
29.97 fps
```
Video reference display

[Down]

```
Timecode    Dly
00:00:00:00  N/A
```
Timecode/Delay display

[Down]

```
  Error Stats
 ENTER to View
```
Error status menu

[Down]

```
Firmware Version
1.0.0.0
```
DM100 firmware version

[Down]

3.2.1   Dolby E Metadata Input Menu

After pressing [ENTER] to view this menu, press the [Down] or [Up] button to select the submenu options you wish to display.

```
Dolby E MD
ENTER to View
```

```
DE Prog Config
ENTER to View
```
[Down]

See page 3-2 for the list of possible program configurations displayed.

```
Dolby E Prog 1
ENTER to View
```
[Down]

```
Dolby E Prog 2—8
(depending on Dolby E
program configuration)
```
[Down]

23.98 fps
24 fps
25 fps [PAL]
29.97 fps [NTSC]
30 fps
50 fps
59.94 fps
60 fps
****
N/A

```
DE Bit Depth
16, 20, or 24Bit
```
[Down]

```
DE Frame Rate
29.97 fps
```
[Down]

```
DE Guard Band
500 Lines
```

The number of video lines between the video reference frame boundary and the Dolby E frame boundary.	xxx Lines
Dolby E input not present or DM100 decode format is not Dolby E	*blank*
Video reference not present	N/A
Video reference not equal to Dolby E frame rate	*** lines
During an audio-follow-video switch, the Dolby E frame is in danger of corruption if the "lines" value displayed in this status screen is less than 8 or greater than 30 for 29.97-frame (NTSC), or, less than 7 or greater than 35 for 25-frame (PAL).	

```
Px Prog Desc
```
[Down]
```
Px Dialogue Lev
```
[Down]
```
Px Channel Mode
```
[Down]
```
Px LFE Channel
```
[Down]
```
Px Bitstrm Mode
```
[Down]
```
Px Line Mode Pro
```
[Down]
```
Px RF Mode Pro
```
[Down]
```
Px RF Ov Protect
```
[Down]
```
Px Center Dwnmx
```
[Down]
```
Px Srnd Dwnmx
```
[Down]
```
Px Dolby Srnd
```
[Down]
```
Px Mixing Level
```
[Down]
```
Px Room Type
```
[Down]
```
Px Copyright
```
[Down]
```
Px Orig Bitstrm
```
[Down]
```
Px Extnd Bitstrm
```
[Down]
```
Px DC Filter
```
[Down]
```
Px Lowpass Filt
```
[Down]
```
Px LFE Filter
```
[Down]
```
Px Srnd 3dB Attn
```
[Down]
```
Px Srnd Ph Shift
```
[Down]
```
Px Begin Gain
```
[Down]
```
Px End Gain
```

"Px" represents the selected program number, where x is a number between 1 and 8. Valid program numbers depend on the Dolby E program configuration. For example, 5.1+2 is two programs; therefore, only P1 and P2 are valid.

Each metadata program parameter selection is described in the following sections.

Px Prog Desc

Dolby E program description display:

```
Px Prog Descr
Description text
```

The DM100 has a 32-character buffer for each program, which stores the first characters in the description text field for that program. The display scrolls through the text automatically if the string is greater than 16 characters.

Px Dialogue Lev

A typical example is shown for the Dolby E Dialogue Normalization display:

```
P2 Dialogue Lev
   –27 dB
```

```
***************
    –1 dB
    –2 dB
    –3 dB
```

```
   –31 dB
    N/A
```
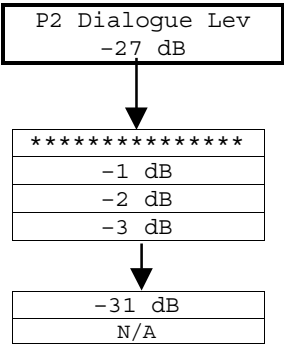
Px Channel Mode

A typical example is shown for the Dolby E Channel Mode display:

```
┌─────────────────────┐
│   P2 Channel Mode   │
│     2/0 Stereo      │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│        1+1          │
├─────────────────────┤
│      1/0 Mono       │
├─────────────────────┤
│     2/0 Stereo      │
├─────────────────────┤
│        3/0          │
├─────────────────────┤
│        2/1          │
├─────────────────────┤
│        3/1          │
├─────────────────────┤
│        2/2          │
├─────────────────────┤
│        3/2          │
├─────────────────────┤
│        N/A          │
└─────────────────────┘
```

Px LFE Channel

```
┌─────────────────────┐
│   P2 LFE Channel    │
│      Disabled       │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│      Disabled       │
├─────────────────────┤
│      Enabled        │
├─────────────────────┤
│        N/A          │
└─────────────────────┘
```
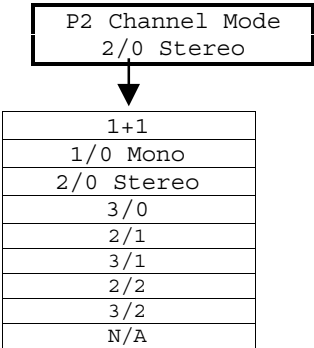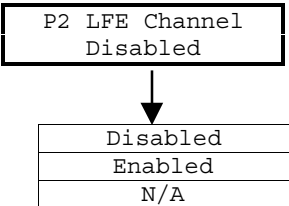
Px Bitstrm Mode

A typical example is shown for the Dolby E Bitstream Mode display:

```
┌─────────────────────┐
│   P2 Bitstrm Mode   │
│    Main Complete    │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│    Main Complete    │
├─────────────────────┤
│      Main M&E       │
├─────────────────────┤
│   Assc Visual Imp   │
├─────────────────────┤
│    Assc Hear Imp    │
├─────────────────────┤
│    Assc Dialogue    │
├─────────────────────┤
│   Assc Commentary   │
├─────────────────────┤
│   Assc Emergency    │
├─────────────────────┤
│   Assc Voice Over   │
├─────────────────────┤
│   Main Sv Karaoke   │
├─────────────────────┤
│        N/A          │
└─────────────────────┘
```
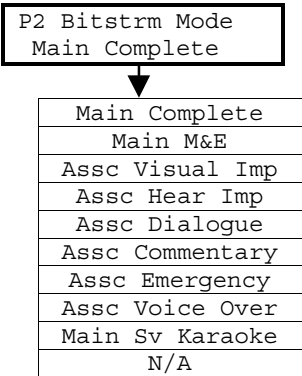
Px Line Mode Pro

Px RF Mode Pro

The Dolby E Line Mode and RF Mode Profile program parameters display the same second-line display.

A typical example is shown for the RF Mode Profile display:

```
┌──────────────────────┐
│   P2 RF Mode Pro     │
│   Music Standard     │
└──────────────────────┘
```

If actual dynamic range control data is present

If dynamic range control presets are present

```
┌──────────────────────┐
│      ±xx dB          │
└──────────────────────┘
```

```
┌──────────────────────┐
│ Press the [ENTER]    │
│ button to toggle     │
│ between a numeric    │
│ display and a bar    │
│ graph level display  │
└──────────────────────┘
```

◄► ■■■■|■■■■ ◄►

RF: **−48 dB**   **0**   **+48 dB**
Line: **−24 dB**   **0**   **+24 dB**

None
Film Standard
Film Light
Music Standard
Music Light
Speech
Invalid
N/A
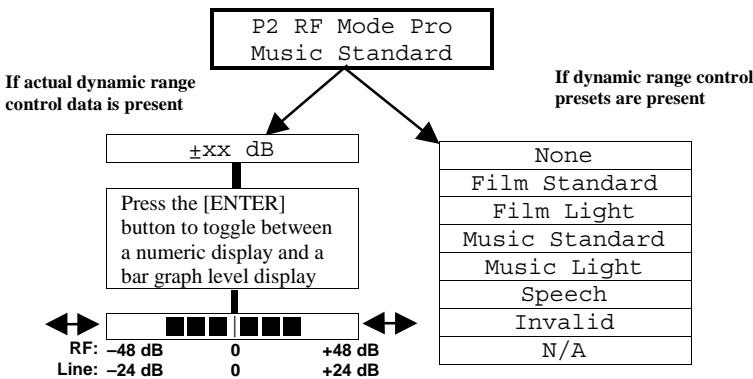
Px RF Ov Protect

RF overmodulation protection.

```
┌──────────────────────┐
│   P2 RF Ov Protect   │
│      Disabled        │
└──────────────────────┘
```

Disabled
Enabled
N/A

Px Center Dwnmx

A typical example is shown for the Dolby E Center Downmix display:

```
┌─────────────────────┐
│ P2 Center Dwnmx     │
│ 0.500 (-6.0 dB)     │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│ 0.707 (-3.0 dB)     │
├─────────────────────┤
│ 0.596 (-4.5 dB)     │
├─────────────────────┤
│ 0.500 (-6.0 dB)     │
├─────────────────────┤
│ **************      │
├─────────────────────┤
│        N/A          │
└─────────────────────┘
```

Px Srnd Dwnmx

A typical example is shown for the Dolby E Surround Downmix display:

```
┌─────────────────────┐
│ P2 Srnd Dwnmx       │
│ 0.707 (-3.0 dB)     │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│ 0.707 (-3.0 dB)     │
├─────────────────────┤
│ 0.500 (-6.0 dB)     │
├─────────────────────┤
│  0 (-999 dB)        │
├─────────────────────┤
│ **************      │
├─────────────────────┤
│        N/A          │
└─────────────────────┘
```

Px Dolby Srnd

A typical example is shown for the Dolby E Surround Mode display:

```
┌─────────────────────┐
│ P2 Dolby Srnd       │
│ Not Indicated       │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│   Not Indicated     │
├─────────────────────┤
│  Not Dolby Srnd     │
├─────────────────────┤
│   Dolby Srnd        │
├─────────────────────┤
│ **************      │
├─────────────────────┤
│        N/A          │
└─────────────────────┘
```

Px Mixing Level

A typical example is shown for the Dolby E Mixing Level display:

```
┌─────────────────────┐
│   P2 Mixing Level    │
│        80 dB         │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│        80 dB         │
├─────────────────────┤
│        81 dB         │
├─────────────────────┤
│        82 dB         │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│       111 dB         │
├─────────────────────┤
│    Does Not Exist    │
├─────────────────────┤
│         N/A          │
└─────────────────────┘
```

Px Room Type

A typical example is shown for the Dolby E Room Type display:

```
┌─────────────────────┐
│    P2 Room Type      │
│        80 dB         │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│    Not Indicated     │
├─────────────────────┤
│        Large         │
├─────────────────────┤
│        Small         │
├─────────────────────┤
│ ****************     │
├─────────────────────┤
│    Does Not Exist    │
├─────────────────────┤
│         N/A          │
└─────────────────────┘
```
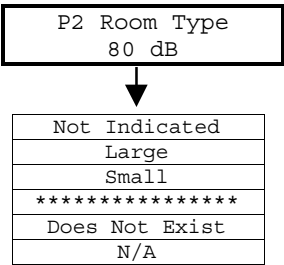
Px Copyright

Px Orig Bitstrm

A typical example is shown for the Dolby E Copyright display. The Original Bitstream program parameters displays the same second line:

```
┌─────────────────────┐
│    P2 Copyright      │
│         No           │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│         No           │
├─────────────────────┤
│        Yes           │
├─────────────────────┤
│         N/A          │
└─────────────────────┘
```
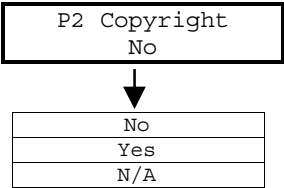
Px Extnd Bitstrm

A typical example is shown for the Extended Bitstream metadata display. Other possibilities are shown:

```
┌─────────────────────┐       ┌─────────────────────────┐
│ Px Extnd Bitstrm    │──────▶│   P2 Pref Dwnmx         │
│ ENTER to view       │       │       Lt/Rt             │
└─────────────────────┘       └─────────────────────────┘
```

Dolby E Preferred Downmix Status

Not Indicated
Lt/Rt
Lo/Ro
****
Does Not Exist
N/A

Px Pref Dwnmx
[Down]
Px Lt/Rt C Dwnmx
[Down]
Px Lt/Rt S Dwnmx
[Down]

Dolby E Downmix Level Status

1.414 (+3.0 dB)
1.189 (+1.5 dB)
1.000 (+0.0 dB)
0.841 (−1.5 dB)
0.707 (−3.0 dB)
0.595 (−4.6 dB)
0.500 (−6.0 dB)
0 (−999 dB)
Not Active
Does Not Exist
N/A

Px Lo/Ro C Dwnmx
[Down]
Px Lo/Ro S Dwnmx
[Down]
Px Dolby Srnd EX
[Down]

Dolby E Surround EX Status

Not Indicated
Not Srnd EX
Dolby Srnd EX
****
Not Active
Does Not Exist
N/A

Px A/D Conv Type

Dolby E A/D Converter Type

Standard
HDCD
Does Not Exist
N/A

Px DC Filter

Px Lowpass Filt

```
┌─────────────────────┐
│  P2 Lowpass Filt    │
│     Disabled        │
└─────────────────────┘
```

Px LFE Filter

Px Srnd 3dB Attn

```
┌─────────────────────┐
│     Disabled        │
├─────────────────────┤
│     Enabled         │
├─────────────────────┤
│      N/A            │
└─────────────────────┘
```

Px Srnd Ph Shift

When any of these Dolby E metadata program is selected, the DM100 displays the same information as shown in the example. A typical example is shown for the Dolby E Lowpass Filter display.

Px Begin Gain

Px End Gain

A typical example is shown for the Dolby E Begin Gain and End Gain display:

```
┌─────────────────────┐       ┌──────────────────────┐
│   Px Begin Gain     │──────▶│  P2 LFE Begin Gain ─  │
│   ENTER to view     │       │  ─  +12.34 dB         │
└─────────────────────┘       └──────────────────────┘
```

Gain
```
┌─────────────────────┐
│  ± yy.yy dB         │
├─────────────────────┤
│  -inf               │
├─────────────────────┤
│  N/A                │
└─────────────────────┘
```

"N/A" indicates Dolby E input is not present or DM100 decode format is not Dolby E.

On Programs 1, 2, 3, 4   `Px L Bgn Gain`
                         [Down]
On Programs 1–8   `Px C Bgn Gain`
                         [Down]
On Program 1   `Px Ls Bgn Gain`
                         [Down]
On Programs 1, 2, 3, 4   `Px R Bgn Gain`
                         [Down]
On Program 1   `Px LFE Bgn Gain`
                         [Down]
On Program 1   `Px Rs Bgn Gain`
                         [Down]
On Programs 1,2   `Px S Bgn Gain`

3.2.2   **Dolby Digital Metadata Input Menu**

After pressing [ENTER] to select this function, press the [Down] or [Up] button to select the parameter you wish to display.

```
┌─────────────────────┐
│ Dolby Digital MD    │        ┌─────────────────────┐
│   ENTER to View  ───┼──────▶ │ DD Dialogue Lev     │
└─────────────────────┘        └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Channel Mode     │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD LFE Channel      │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Data Rate        │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Bitstrm Mode     │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Line Mode Pro    │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD RF Mode Pro      │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Center Dwnmx     │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Srnd Dwnmx       │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Dolby Srnd       │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Mixing Level     │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Room Type        │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Copyright        │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Orig Bitstrm     │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Extnd Bitstrm    │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Dual Mono MD     │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Format           │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Sample Rate      │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Bitstream ID     │
                               └─────────────────────┘
                                    [Down]
                               ┌─────────────────────┐
                               │ DD Stream #         │
                               └─────────────────────┘
```

Each Dolby Digital metadata parameter display is described in the following manual sections.

DD Dialogue Lev

A typical example is shown for the Dolby Digital Dialogue
Normalization Status display:

```
┌─────────────────────┐
│   DD Dialogue Lev   │
│      -27 dB      ────┼──────────┐
└─────────────────────┘          │
                                 ▼
                    ┌──────────────────────┐
                    │  **************      │
                    ├──────────────────────┤
                    │        -1 dB         │
                    ├──────────────────────┤
                    │        -2 dB         │
                    ├──────────────────────┤
                    │        -3 dB         │
                    └──────────────────────┘
                    ┌──────────────────────┐
                    │        -31 dB        │
                    ├──────────────────────┤
                    │         N/A          │
                    └──────────────────────┘
```

DD Channel Mode

A typical example is shown for the Dolby Digital Channel Mode
display:

```
┌─────────────────────┐
│   DD Channel Mode   │
│     2/0 Stereo   ───┼──────────┐
└─────────────────────┘          │
                                 ▼
                    ┌──────────────────────┐
                    │         1+1          │
                    ├──────────────────────┤
                    │       1/0 Mono       │
                    ├──────────────────────┤
                    │      2/0 Stereo      │
                    ├──────────────────────┤
                    │         3/0          │
                    ├──────────────────────┤
                    │         2/1          │
                    ├──────────────────────┤
                    │         3/1          │
                    ├──────────────────────┤
                    │         2/2          │
                    ├──────────────────────┤
                    │         3/2          │
                    ├──────────────────────┤
                    │         N/A          │
                    └──────────────────────┘
```
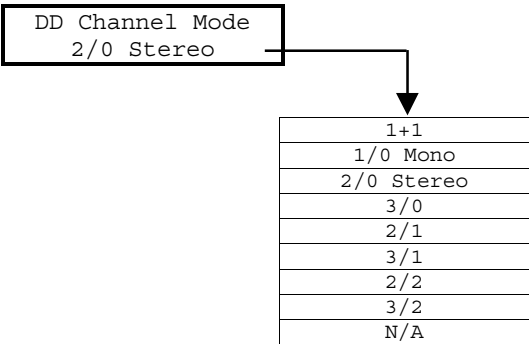
DD LFE Channel

A typical example is shown for the Dolby Digital LFE Status
display:

```
┌─────────────────────┐
│   DD LFE Channel    │
│     Disabled     ───┼──────────┐
└─────────────────────┘          │
                                 ▼
                    ┌──────────────────────┐
                    │       Disabled       │
                    ├──────────────────────┤
                    │       Enabled        │
                    ├──────────────────────┤
                    │         N/A          │
                    └──────────────────────┘
```
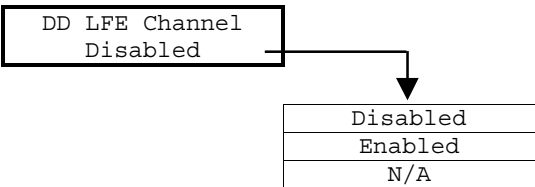
DD Data Rate

A typical example is shown for the Dolby Digital Data Rate display:

```
┌─────────────────────┐
│    DD Data Rate     │
│     448 kbps      ──┼────────┐
└─────────────────────┘        │
                               │
                               ▼
                    ┌──────────────────┐
                    │      56 kbps     │
                    │      64 kbps     │
                    │      80 kbps     │
                    │      96 kbps     │
                    │     112 kbps     │
                    │     128 kbps     │
                    │     160 kbps     │
                    │     192 kbps     │
                    │     224 kbps     │
                    │     256 kbps     │
                    │     320 kbps     │
                    │     384 kbps     │
                    │     448 kbps     │
                    │     512 kbps     │
                    │     576 kbps     │
                    │     640 kbps     │
                    │       N/A        │
                    └──────────────────┘
```
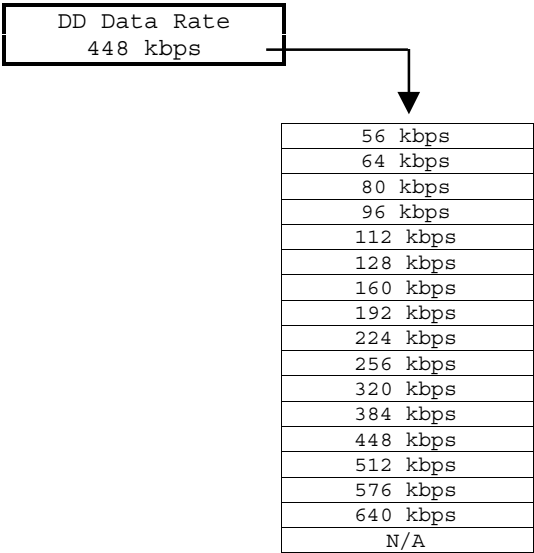
DD Bitstrm Mode

A typical example is shown for the Dolby Digital Bitstream Mode display:

```
┌─────────────────────┐
│   DD Bitstrm Mode   │
│   Main Complete   ──┼────────┐
└─────────────────────┘        │
                               │
                               ▼
                    ┌──────────────────┐
                    │   Main Complete  │
                    │    Main M & E    │
                    │  Assc Visual Imp │
                    │   Assc Dialogue  │
                    │  Assc Commentary │
                    │  Assc Emergency  │
                    │  Assc Voice Over │
                    │  Main Sv Karaoke │
                    │       N/A        │
                    └──────────────────┘
```
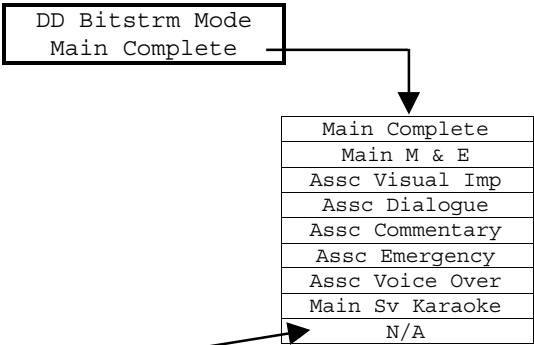
"N/A" indicates that a Dolby Digital input is not present, or the DM100 decode format is not Dolby Digital.

DD Line Mode Pro

DD RF Mode Pro
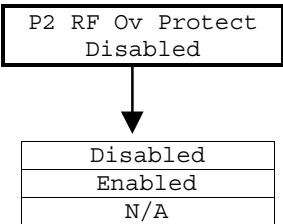
The Dolby Digital Line Mode and RF Mode Profile parameters give the same display style.

A typical example is shown for the RF Mode Profile display:

```
┌────────────────────────┐
│     DD RF Mode Pro      │
│        ±xx dB           │
└────────────────────────┘
```

If compre or dynrnge = 0, the level displayed is 0.
If compre or dynrnge = 1, The level displayed is the decoded compr or dynrng value from the metadata.

```
┌────────────────────────┐
│        ±xx dB           │
└────────────────────────┘
```

Press [ENTER] to toggle between a numeric display and a bar graph level display

```
◀▶ ┌──────────────────────┐ ◀▶
   │    ■■■ ▌ ■■■          │
   └──────────────────────┘
```

Rf: **−48 dB**   **0**   **+48 dB**
Line: **−24 dB**   **0**   **+24 dB**
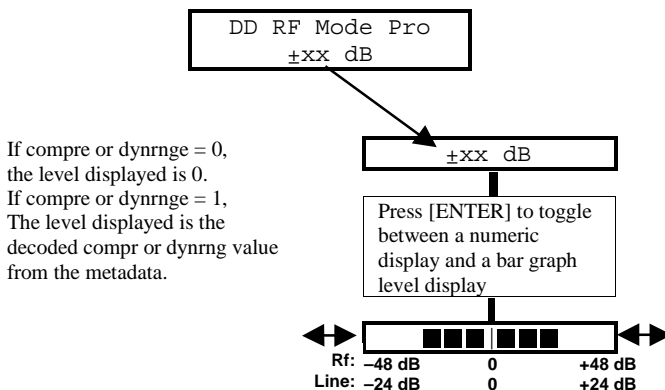
DD Center Dwnmx

A typical example is shown for the Dolby Digital Center Downmix display:

```
┌────────────────────────┐
│    DD Center Dwnmx      │
│    0.707 (−3.0 dB)      │
└────────────────────────┘
```

```
┌────────────────────────┐
│  0.707 (-3.0 dB)        │
├────────────────────────┤
│  0.596 (-4.5 dB)        │
├────────────────────────┤
│  0.500 (-6.0 dB)        │
├────────────────────────┤
│  ***************        │
├────────────────────────┤
│     Not Active          │
├────────────────────────┤
│        N/A              │
└────────────────────────┘
```
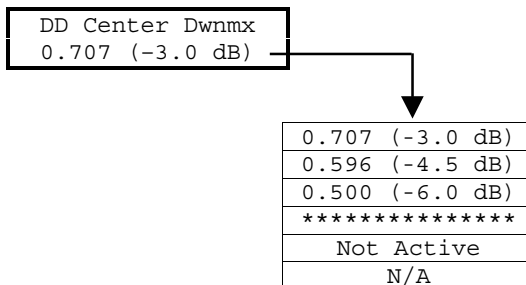
DD Srnd Dwnmx

A typical example is shown for the Dolby Digital Surround Downmix display:

```
    DD Srnd Dwnmx
  0.707 (-3.0 dB)
```

```
  0.707 (-3.0 dB)
  0.500 (-6.0 dB)
    0 (-999 dB)
  ***************
    Not Active
       N/A
```
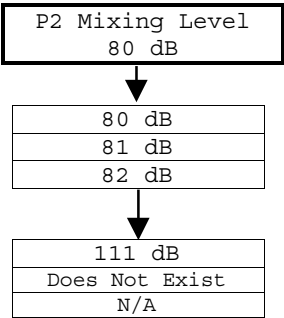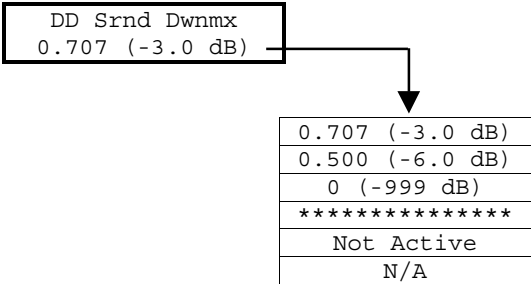
DD Dolby Srnd

A typical example is shown for the Dolby Digital, Dolby Surround Mode display:

```
   DD Dolby Srnd
   Not Indicated
```

```
   Not Indicated
   Not Dolby Srnd
    Dolby Srnd
  ***************
    Not Active
       N/A
```
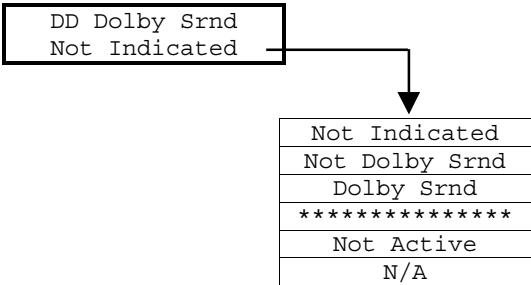
DD Mixing Level

A typical example is shown for the Dolby Digital Mixing Level status display:

```
  DD Mixing Level
      80 dB
```

```
      80 dB
      81 dB
      82 dB
```

```
     111 dB
  Does Not Exist
       N/A
```
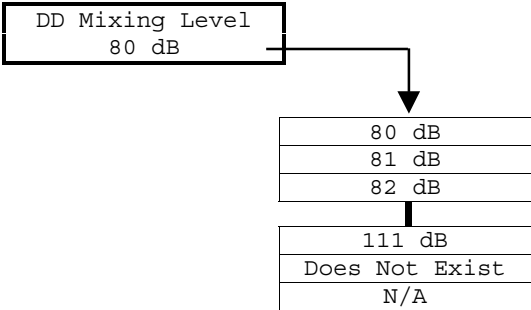
DD Room Type

A typical example is shown for the Dolby Digital Room Type display:

```
┌─────────────────────┐
│   DD Room Type      │
│      Large        ──┤──────────┐
└─────────────────────┘          │
                                 │
                                 ▼
                    ┌─────────────────────┐
                    │   Not Indicated     │
                    ├─────────────────────┤
                    │      Large          │
                    ├─────────────────────┤
                    │      Small          │
                    ├─────────────────────┤
                    │ ***************     │
                    ├─────────────────────┤
                    │  Does Not Exist     │
                    ├─────────────────────┤
                    │      N/A            │
                    └─────────────────────┘
```
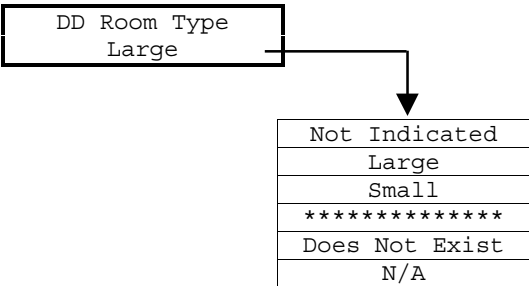
DD Copyright

DD Orig Bitstrm

A typical example is shown for the Dolby Copyright status display. The Original Bitstream program parameters displays the same second-line:
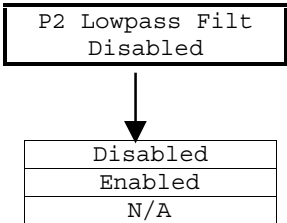
```
┌─────────────────────┐
│   DD Copyright      │
│      Yes          ──┤──────────┐
└─────────────────────┘          │
                                 │
                                 ▼
                    ┌─────────────────────┐
                    │        No           │
                    ├─────────────────────┤
                    │        Yes          │
                    ├─────────────────────┤
                    │        N/A          │
                    └─────────────────────┘
```
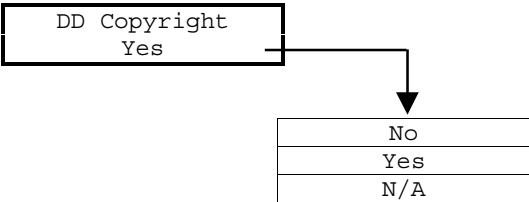
DD Extnd Bitstrm

A typical example is shown for the Extended Bitstream information display. Other possibilities are shown:

```
┌─────────────────────┐        ┌─────────────────────┐
│ Px Extnd Bitstrm    │───────▶│   DD Pref Dwnmx      │
│ ENTER to view       │        │      Lt/Rt           │
└─────────────────────┘        └─────────────────────┘
```

Dolby Digital Preferred Downmix Status	
Not Indicated	
LtRt	
LoRo	
****************	
Does Not Exist	
N/A	

```
┌─────────────────────┐
│   DD Pref Dwnmx      │
└─────────────────────┘
         [Down]
┌─────────────────────┐
│  DD Lt/Rt C Dwnmx    │
└─────────────────────┘
         [Down]
┌─────────────────────┐
│  DD Lt/Rt S Dwnmx    │
└─────────────────────┘
         [Down]
┌─────────────────────┐
│  DD Lo/Ro C Dwnmx    │
└─────────────────────┘
         [Down]
┌─────────────────────┐
│  DD Lo/Ro S Dwnmx    │
└─────────────────────┘
         [Down]
┌─────────────────────┐
│  DD Dolby Srnd EX    │
└─────────────────────┘
         [Down]
┌─────────────────────┐
│  DD A/D Conv Type    │
└─────────────────────┘
```

Dolby Digital Downmix Level Status

1.414 (+3.0 dB)
1.189 (+1.5 dB)
1.000 (+0.0 dB)
0.841 (−1.5 dB)
0.707 (−3.0 dB)
0.595 (−4.6 dB)
0.500 (−6.0 dB)
0 (−999 dB)
Not Active
Does Not Exist
N/A

Dolby Digital Surround EX Status

Not Indicated
Not Srnd EX
Dolby Srnd EX
****
Not Active
Does Not Exist
N/A

Dolby Digital A/D Converter Type

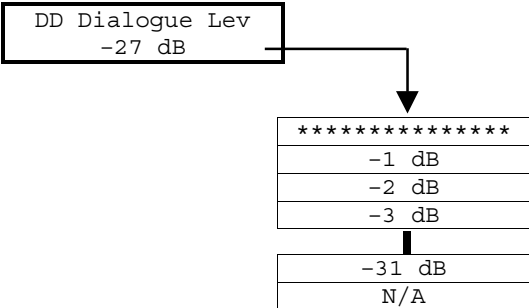| |
|---|
| Standard |
| HDCD |
| Does Not Exist |
| N/A |

DD Dual Mono MD

After pressing [ENTER] to select this function, press the [Down] or [Up] button to select the Dual Mono metadata parameter you wish to display. A typical example screen is shown:

```
┌─────────────────────┐          ┌─────────────────────┐
│ DD Dual Mono MD     │─────────▶│   DM Dialogue Lev   │
│ ENTER to view       │          │      -27 dB         │
└─────────────────────┘          └─────────────────────┘
```

```
                    ┌─────────────────────┐                    ┌─────────────────────┐
                    │ ***************** │                    │  DM Dialogue Lev    │
                    │       -1 dB         │                    └─────────────────────┘
Dual Mono           │       -2 dB         │                         [Down]
Dialogue            │       -3 dB         │                    ┌─────────────────────┐
Normalization       │                     │                    │  DM Mixing Level    │
Status              │      -31 dB         │                    └─────────────────────┘
                    │       N/A           │                         [Down]
                    └─────────────────────┘                    ┌─────────────────────┐
                                                               │   DM Room Type      │
                    ┌─────────────────────┐                    └─────────────────────┘
                    │       80 dB         │                         [Down]
Dual Mono           │       81 dB         │                    ┌─────────────────────┐
Mixing Level        │       82 dB         │                    │  DM RF Mode Pro     │
Status              │                     │                    └─────────────────────┘
                    │      111 dB         │                         [Down]
                    │   Does Not Exist    │                    ┌─────────────────────┐
                    │       N/A           │                    │  DM Line Mode Pro   │
                    └─────────────────────┘                    └─────────────────────┘

                    ┌─────────────────────┐
                    │   Not Indicated     │
Dual Mono           │      Large          │
Room Type           │      Small          │
Status              │ ***************** │
                    │   Does Not Exist    │
                    │       N/A           │
                    └─────────────────────┘

                    ┌─────────────────────┐          If the Dolby Digital bitstream is
                    │      ±xx dB         │          not a Dual Mono bitstream, the
                    └─────────────────────┘          level displayed will be 0

                    ┌─────────────────────┐
                    │ Press [ENTER] to toggle │
                    │ between a numeric       │
                    │ display and a bar graph │
                    │ level display           │
                    └─────────────────────┘
```

```
◆▶  ┌──────────────────────┐  ◆▶
    │   ■■■ ■■■           │
    └──────────────────────┘
RF:   -48 dB      0      +48 dB
Line: -24 dB      0      +24 dB
```

DD Format

A typical example is shown for the Dolby Digital Format status display:

```
┌─────────────────────┐
│     DD Format       │
│     Pro 32-bit      │───────────┐
└─────────────────────┘           │
                                  │
                                  ▼
                      ┌─────────────────────┐
                      │     Pro 32-bit      │
                      ├─────────────────────┤
                      │   Pro 16-bit Ch1    │
                      ├─────────────────────┤
                      │   Pro 16-bit Ch2    │
                      ├─────────────────────┤
                      │  Pro 16-bit Ch1&2   │
                      ├─────────────────────┤
                      │     Consumer        │
                      ├─────────────────────┤
                      │       N/A           │
                      └─────────────────────┘
```
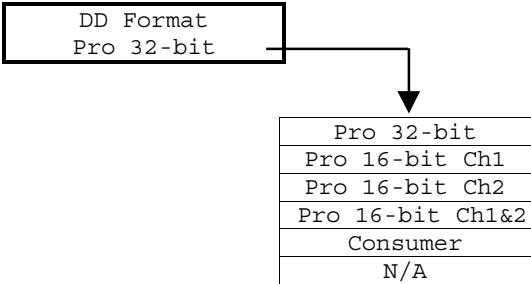
DD Sample Rate

A typical example is shown for the Dolby Digital Sample Rate status display:

```
┌─────────────────────┐
│   DD Sample Rate    │
│      48 kHz         │───────────┐
└─────────────────────┘           │
                                  │
                                  ▼
                      ┌─────────────────────┐
                      │      48 kHz         │
                      ├─────────────────────┤
                      │     44.1 kHz        │
                      ├─────────────────────┤
                      │      32 kHz         │
                      ├─────────────────────┤
                      │       N/A           │
                      └─────────────────────┘
```

DD Bitstream ID

A typical example is shown for the Dolby Digital Bitstream ID status display:

```
┌─────────────────────┐
│   DD Bitstream ID   │
│         8           │───────────┐
└─────────────────────┘           │
                                  │
                                  ▼
                      ┌─────────────────────┐
                      │         1           │
                      └─────────────────────┘
                      ┌─────────────────────┐
                      │         8           │
                      ├─────────────────────┤
                      │        N/A          │
                      └─────────────────────┘
```
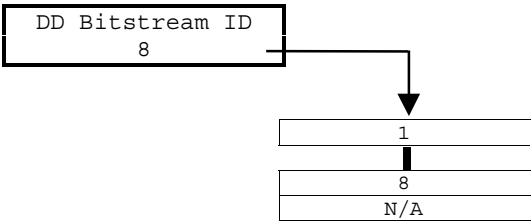
DD Stream

A typical example is shown for the Dolby Digital Stream Number status display:

```
 ┌──────────────────────┐
 │     DD Stream #      │
 │          0           │──────────┐
 └──────────────────────┘          │
                                    ▼
                         ┌──────────────────────┐
                         │          1           │
                         └──────────────────────┘
                         ┌──────────────────────┐
                         │          7           │
                         ├──────────────────────┤
                         │         N/A          │
                         └──────────────────────┘
```
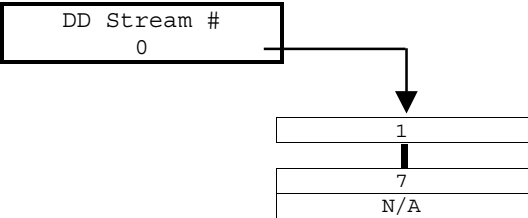
3.2.3   AES3 Status Menu

After pressing [ENTER] to select this menu, press the [Down] or
[Up] button to select the AES3 parameter you wish to display. A
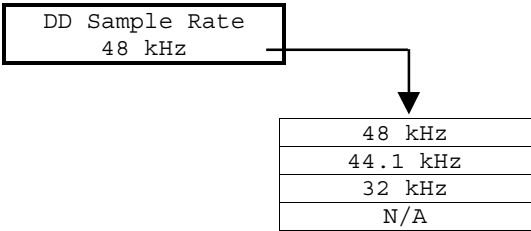typical example screen is shown:

```
 AES3 Status                          AES3 Mode
ENTER to view        ───────▶        Professional
```

Consumer
Professional
N/A

                                        AES3 Mode
                                        ─────────
                                         [Down]

Audio
Non-Audio
N/A

                                        Audio Mode
                                        ──────────
                                         [Down]

Not Indicated
Reserved (1)
Reserved (2)
Reserved (3)
No Emphasis
Reserved (5)
50/15-us Emph
J.17 Emph
N/A

                                         Emphasis
                                        ──────────
                                         [Down]

                                        Freq Mode
                                        ─────────
                                         [Down]

Locked
Unlocked
N/A

                                        Sample Freq

Not Indicated
48 kHz
44.1 kHz
32 kHz
N/A
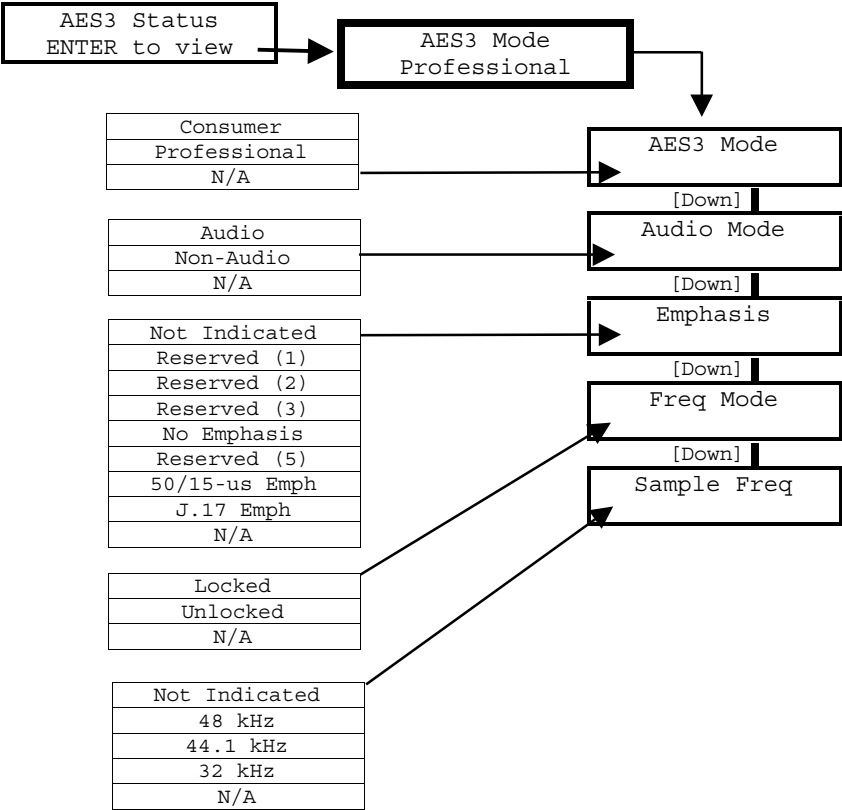
3.2.4   Input Level Menu

Press [ENTER] to display Input Level status. The display combinations are shown below. A typical example screen is shown:

Input is Dolby E	**DE**
Input is Dolby Digital	**DD**
Input is PCM	**PCM**
No input, or channel not present in input bitstream	**blank**

Prog 1—8	Displays program number if the input bitstream is Dolby E.
Blank	Input not Dolby E

Ch1 — 8

Input Level
ENTER to view

```
Ch1 DE Prog 1 L
 -10 dB -6 dB
```

dB RMS   dB Peak

Press [ENTER] to toggle between numeric display and a bargraph RMS level display.

– 90 dB   **RMS level**   0 dB
Digital Full-Scale

Left Front	**L**
Right Front	**R**
Center	**C**
Low Frequency Effects	**LFE**
Left Surround	**Ls**
Right Surround	**Rs**
Mono Surround	**S**
Ch 1 of a 1+1 stream	**C1**
Ch 2 of a 1+1 stream	**C2**
Channel not present in input bitstream	**Blank**

3.2.5   Generator Status Display

Press [ENTER] to display Generator status. The possible display combinations are shown below:

```
   Generator
ENTER to view
```

The unit is generating a
non-PCM bitstream

```
   Generating
 bitstream name
```

OR

The unit is generating a
PCM bitstream

```
PCM        name
```

OR

The unit is in pass
through mode

```
     blank
  Pass Through
```

Waveform is Sine or Square Frequency and level in dBFS	`xxxxxHz    -yydB`
Waveform is Frequency Sweep Frequency range and level in dBFS	`F1—F2      -yydB`
Waveform is Pink or White Noise Level in dBFS	`-yydB`
Waveform is Silence	`blank`

See section 4.2 for selecting stream and waveform names and frequencies.

3.2.6   Video Reference Status Display

A typical example is shown for the Video Reference input status display:

```
   Video Ref
   29.29 fps
```

Frame Rate	`25 fps`
	`29.97 fps`
No video input	`No Input`
Video input present but invalid	`Video Ref Error`
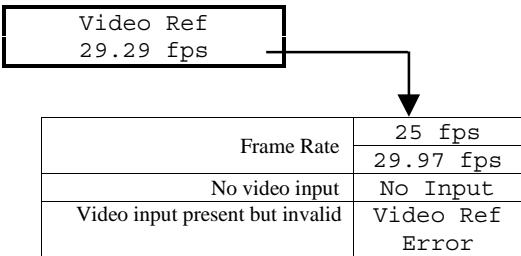
3.2.7   **Timecode Status Display**

```
Timecode    Dly
00:00:00:00  N/A
```

Timecode

Timestamp data burst delay, if present, indicates the encode latency referenced to A/V sync. A positive number indicates an advance in milliseconds from the reference, while a negative number indicates a delay.
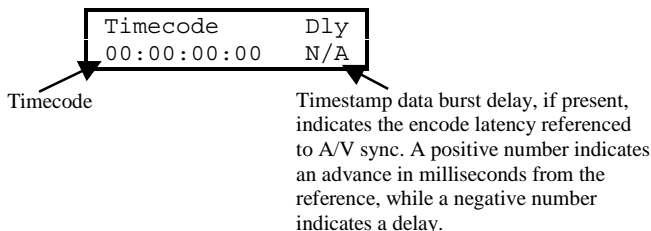
Dolby Digital
Timecode data as derived from the timestamp of the stream currently being decoded (if present). Encoding latency can be conveyed to a downstream MPEG broadcast encoder with a Dolby Digital stream.

Dolby E
Timecode data as carried within the Dolby E bitstream, derived from the metadata.

"00:00:00:00 N/A"
The display shown above occurs under any of the following conditions:

- A Dolby E or Dolby Digital bitstream is not being decoded (this includes selecting the PCM portion of a 16-bit Dolby Digital/PCM stream).

- The current Dolby E timecode field is set to "invalid" or the Dolby Digital bitstream does not contain timecode.

3.2.8   Error Statistics Menu

After pressing [ENTER] to select the Error Statistics menu, press the [Down] or [Up] button to select the error screen for each format. A typical example screen is shown.

The display is a running count of a particular error. Error counts over 99 will display as 99. Press [ENTER] to reset a displayed error count to 00.

```
 Error Stats              Dolby E Errors
ENTER to view      →         CRC:04
```

```
                        Dolby E Errors
                           CRC:xx
                          [Down]
                        Dolby D Errors
                           CRC:xx
                          [Down]
                        AES3 Errors 1
Parity, Code, Confidence   P:aa CD:bb CF:cc
                          [Down]
                        AES3 Errors 2
Professional Channel Status CRC    CCRC:dd
```
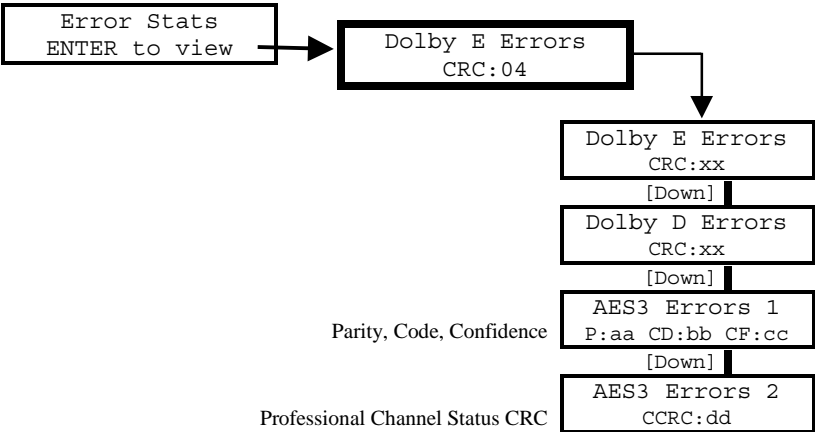
3.2.9   DM100 Firmware Version

This last Status menu item displays the version of the firmware currently installed in your DM100.

```
Firmware Version
    1.0.0.0
```
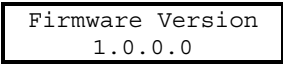
Pressing [DOWN], [ESC], or [STATUS] returns the display to the top-level Main Status screen.

Chapter 4
Operation: Setup Mode

Pressing [SETUP] switches the DM100 into Setup mode. Use this function to configure your DM100. All setup settings are saved when the unit is turned off. The settings shown in **bold** are the factory defaults.

The Setup Menus

```
┌─────────────────────┐
│ DM100 Main Setup    │
│  Monitor Control ───┼────────────┐
└─────────────────────┘            │
                                   ▼
                        ┌─────────────────────┐
                        │ Monitor Control     │
                        └─────────────────────┘
                          [Down] █
                        ┌─────────────────────┐
                        │ Gen Control         │
                        └─────────────────────┘
                          [Down] █
                        ┌─────────────────────┐
                        │ AES3 Output         │
                        └─────────────────────┘
                          [Down] █
                        ┌─────────────────────┐
                        │ User Presets        │
                        └─────────────────────┘
                          [Down] █
                        ┌─────────────────────┐
                        │ I/O Control         │
                        └─────────────────────┘
                          [Down] █
                        ┌─────────────────────┐
                        │ System Settings     │
                        └─────────────────────┘
```
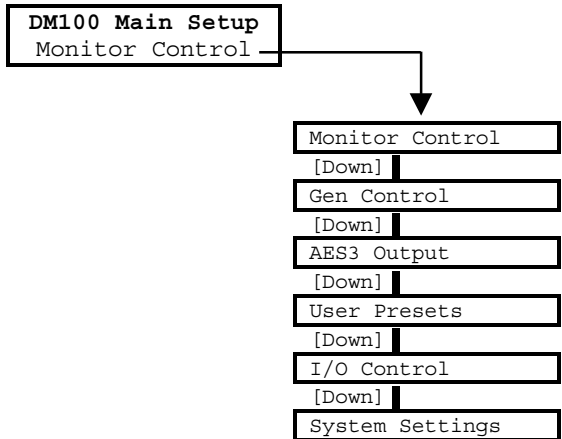
The following pages show the setup selections available for each of the menu choices.

4.1   Monitor Control

The Monitor Control menu contains all of the functions that control the audio output of the DM100.

Decode Format chooses the type of bitstream the DM100 will decode. This will normally be set to Autodetect; however, it is possible to force the DM100 to decode only one stream type if required.

Output Ch Map chooses which audio channels or downmix (Lt,Rt or Lo,Ro) are output from the headphone or speaker.

Dolby E Prog Sel selects one of the available programs in a Dolby E stream for monitoring.

DE Dialogue Lev applies the metadata parameter Dialogue Level or 'dialnorm' to the audio output of a Dolby E stream.

DD Stream Select and **AES3 Ch Select** choose which signal from a multiplexed Dolby Digital bitstream will be decoded.

DD Compression applies Dolby Digital dynamic range control data to the audio output. RF is the heaviest compression and Custom the lightest. DD compression can be useful when listening in a noisy environment.

```
                              ┌─────────────────────┐
                              │   Monitor Control   │
                              │   Decode Format  ───┼──────────────┐
                              └─────────────────────┘              │
                                                                   ▼
┌─────────────────────┐                            ┌─────────────────────┐
│    Autodetect       │                            │   Decode Format     │
│    Dolby E          │───────────────────────────▶│                     │
│    Dolby Digital    │                            └─────────────────────┘
│    PCM              │                                    [Down] ▌
└─────────────────────┘                            ┌─────────────────────┐
                                                   │   Output Ch Map     │
┌─────────────────────┐                            │                     │
│    L=Lo R=Ro        │───────────────────────────▶└─────────────────────┘
│    L=Lt R=Rt        │                                    [Down] ▌
│    L=L  R=R         │                            ┌─────────────────────┐
│    L=C  R=C         │                            │  Dolby E Prog Sel   │
│    L=Ls R=Rs        │                            │                     │
│    L=LFE R=LFE      │                            └─────────────────────┘
└─────────────────────┘                                    [Down] ▌
                                                   ┌─────────────────────┐
┌─────────────────────┐                            │  DE Dialogue Lev    │
│    Program 1        │                            │                     │
│    Program 8—2      │                            └─────────────────────┘
└─────────────────────┘                                    [Down] ▌
                                                   ┌─────────────────────┐
┌─────────────────────┐                            │  DD Stream Select   │
│    Enabled          │                            │                     │
│    Disabled         │                            └─────────────────────┘
└─────────────────────┘                                    [Down] ▌
                                                   ┌─────────────────────┐
┌─────────────────────┐                            │  AES3 Ch Select     │
│    Autodetect       │                            │                     │
│    Stream 0—7       │                            └─────────────────────┘
└─────────────────────┘                                    [Down] ▌
                                                   ┌─────────────────────┐
┌─────────────────────┐                            │  DD Compression     │
│    Autodetect       │                            │                     │
│    Channel 1        │                            └─────────────────────┘
│    Channel 2        │                                    [Down] ▌
│    Channel 1+2      │                            ┌─────────────────────┐
└─────────────────────┘                            │  Headphone Mode     │
                                                   │                     │
┌─────────────────────┐                            └─────────────────────┘
│    Line Mode        │
│    RF Mode          │
│    Custom           │
└─────────────────────┘

┌─────────────────────┐
│    Stereo           │
│    Mono             │
└─────────────────────┘
```

4.2   Gen Control

The Gen Control menu contains all of the settings for the bitstream generator.

Output Mode switches the generator on or off, either passing through the input signal to the output connectors or connecting the generated signal to the output connectors.
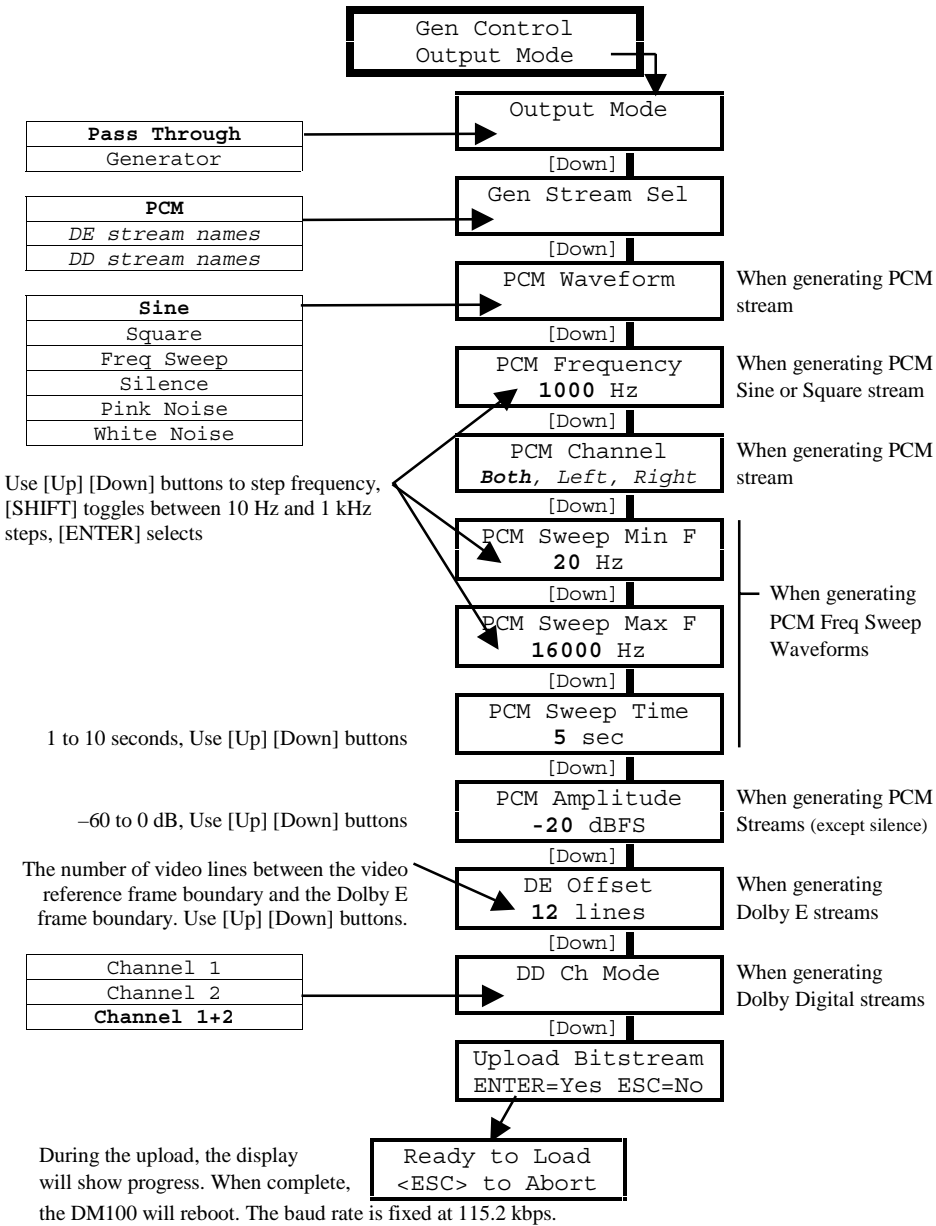
Gen Stream Sel selects the generator output stream from a list of Dolby E, Dolby Digital, and PCM streams.

There is a whole host of settings for the **PCM** generator signal, allowing sine, square, sweep, and pink or white noise signals to be created.

DE Offset allows the Dolby E bitstream to be placed a number of lines away from the video sync point (a valid video reference input is needed for this function).

DD Ch Mode chooses where to place a Dolby Digital stream in the output AES3 stream (Channel 1+2 is the usual setting).

New bitstreams may be uploaded to the DM100 using the **Upload Bitstream** function. To load and store new streams, connect a Windows® PC to the DM100 using the supplied cable. The baud rate is fixed at 115.2 kbps. Activate the Upload Bitstream function on the DM100 and follow the prompts on the PC software supplied. During the upload, the DM100 display will show progress. When complete, the DM100 will reboot.

```
                          ┌──────────────────┐
                          │   Gen Control    │
                          │   Output Mode  ──┼───┐
                          └──────────────────┘   │
                                                  │
┌──────────────────┐      ┌──────────────────┐   │
│  Pass Through    │      │   Output Mode    │◄──┘
│  Generator       │─────►└──────────────────┘
└──────────────────┘            [Down]

┌──────────────────┐      ┌──────────────────┐
│  PCM             │      │  Gen Stream Sel  │
│  DE stream names │─────►└──────────────────┘
│  DD stream names │            [Down]
└──────────────────┘      ┌──────────────────┐
                          │  PCM Waveform    │     When generating PCM
┌──────────────────┐      └──────────────────┘     stream
│  Sine            │            [Down]
│  Square          │      ┌──────────────────┐
│  Freq Sweep      │─────►│  PCM Frequency   │     When generating PCM
│  Silence         │      │   1000 Hz        │     Sine or Square stream
│  Pink Noise      │      └──────────────────┘
│  White Noise     │            [Down]
└──────────────────┘      ┌──────────────────┐
                          │  PCM Channel     │     When generating PCM
Use [Up] [Down] buttons   │  Both, Left, Right     stream
to step frequency,        └──────────────────┘
[SHIFT] toggles between          [Down]
10 Hz and 1 kHz           ┌──────────────────┐
steps, [ENTER] selects    │  PCM Sweep Min F │
                          │   20 Hz          │
                          └──────────────────┘
                                 [Down]
                          ┌──────────────────┐     When generating
                          │  PCM Sweep Max F │     PCM Freq Sweep
                          │   16000 Hz       │     Waveforms
                          └──────────────────┘
                                 [Down]
                          ┌──────────────────┐
1 to 10 seconds, Use      │  PCM Sweep Time  │
[Up] [Down] buttons       │   5 sec          │
                          └──────────────────┘
                                 [Down]
                          ┌──────────────────┐
–60 to 0 dB, Use          │  PCM Amplitude   │     When generating PCM
[Up] [Down] buttons       │   -20 dBFS       │     Streams (except silence)
                          └──────────────────┘
The number of video              [Down]
lines between the video   ┌──────────────────┐
reference frame boundary  │  DE Offset       │     When generating
and the Dolby E           │   12 lines       │     Dolby E streams
frame boundary. Use       └──────────────────┘
[Up] [Down] buttons.             [Down]
┌──────────────────┐      ┌──────────────────┐
│  Channel 1       │      │  DD Ch Mode      │     When generating
│  Channel 2       │─────►└──────────────────┘     Dolby Digital streams
│  Channel 1+2     │            [Down]
└──────────────────┘      ┌──────────────────┐
                          │  Upload Bitstream│
                          │  ENTER=Yes ESC=No│
                          └──────────────────┘

During the upload, the display    ┌──────────────────┐
will show progress. When complete,│  Ready to Load   │
                                  │  <ESC> to Abort  │
the DM100 will reboot. The baud   └──────────────────┘
rate is fixed at 115.2 kbps.
```
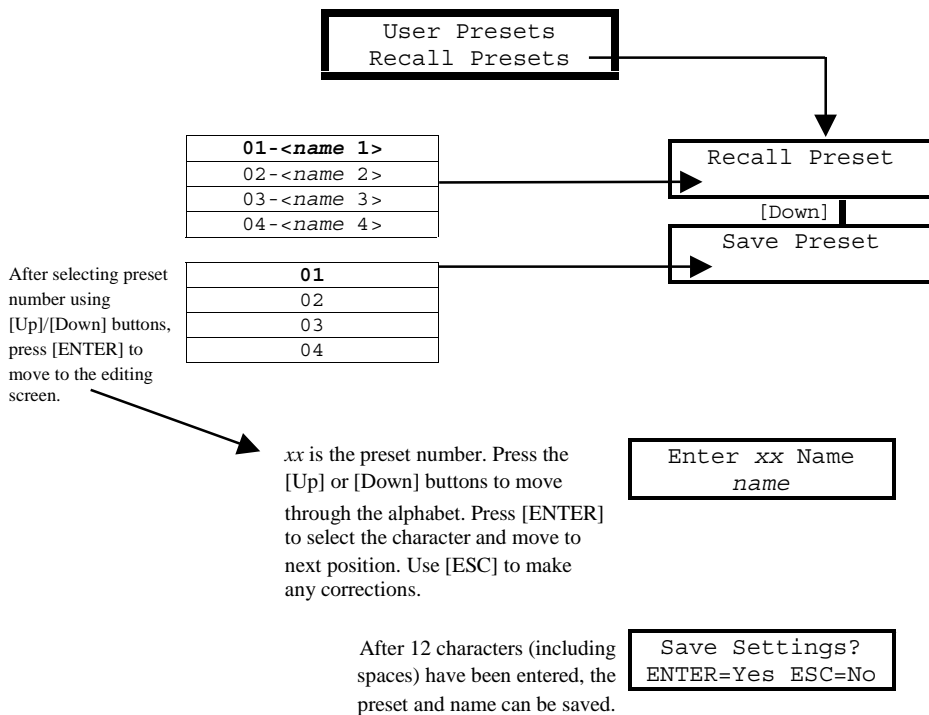
4.3   AES3 Output

The AES3 Output menu allows the user to control the value of the AES3 status bits present on the output of the DM100. The output can be set to pass through each parameter from the input (or from the generator), or each parameter can be manually set to a desired value. When a value has been changed, the current decode LED will flash slowly to indicate this change. To reset all of the parameters, use the pass through all function.
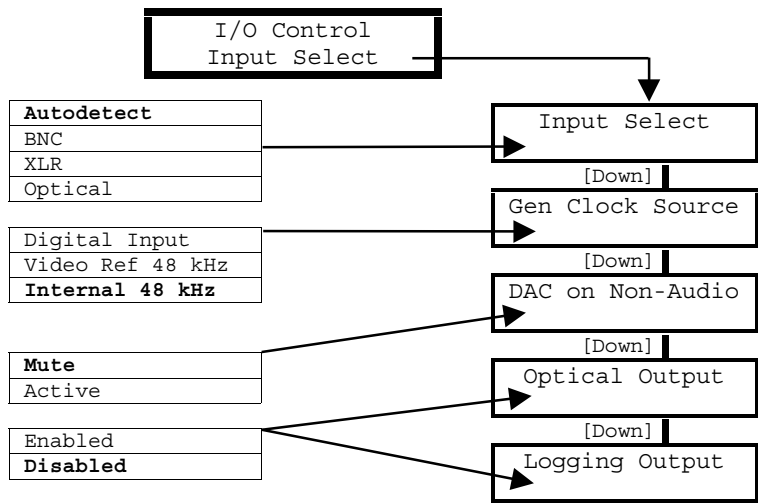
```
                    ┌─────────────────────────┐
                    │      AES3 Output         │
                    │      AES3 Mode           │──────────┐
                    └─────────────────────────┘          │
                                                         │
                                                         ▼
  ┌──────────────────┐              ┌────────────────────────┐
  │   Professional   │              │       AES3 Mode        │
  │    Consumer      │──────────────▶                        │
  │  Pass Through    │              └────────────────────────┘
  └──────────────────┘                     [Down]│
                                     ┌────────────────────────┐
  ┌──────────────────┐              │      Audio Mode        │
  │     Audio        │──────────────▶                        │
  │   Non-Audio      │              └────────────────────────┘
  │  Pass Through    │                     [Down]│
  └──────────────────┘              ┌────────────────────────┐
                                     │       Emphasis         │
  ┌──────────────────┐         ┌────▶                        │
  │  Pass Through    │         │    └────────────────────────┘
  │   J.17 Emph      │         │           [Down]│
  │  50/15-us Emph   │         │    ┌────────────────────────┐
  │  Reserved (5)    │         │    │       Freq Mode        │
  │  No Emphasis     │      ┌──▶    │                        │
  │ Reserved (1-3)   │      │  └────────────────────────────┘
  │  Not Indicated   │      │         [Down]│
  └──────────────────┘      │  ┌────────────────────────┐
                            │  │      Sample Freq       │
  ┌──────────────────┐   ┌──▶  │                        │
  │  Pass Through    │   │  └────────────────────────────┘
  │    Unlocked      │   │       [Down]│
  │     Locked       │   │  ┌────────────────────────┐
  └──────────────────┘   │  │  Pass Through All      │
                         │  │  ENTER=Yes ESC=No      │
  ┌──────────────────┐   │  └────────────────────────┘
  │  Pass Through    │   │
  │    32 kHz        │───┘
  │   44.1 kHz       │
  │    48 kHz        │
  │  Not Indicated   │
  └──────────────────┘
```
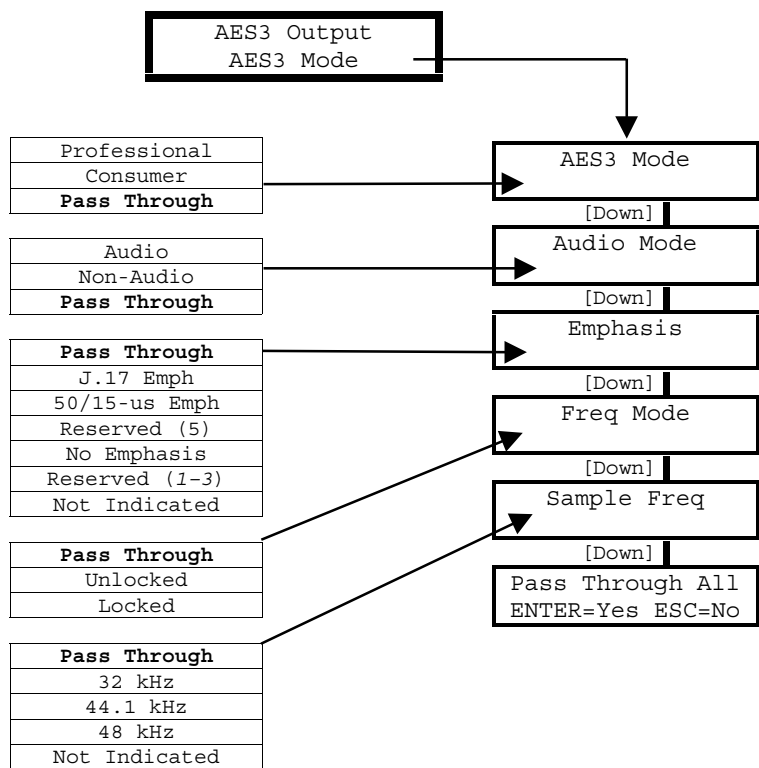
4.4   User Presets

Up to four user presets can be saved, named, and recalled. These presets contain a copy of the DM100 setup information.

```
╔══════════════════════════╗
║     User Presets         ║
║   Recall Presets         ║
╚══════════════════════════╝
```
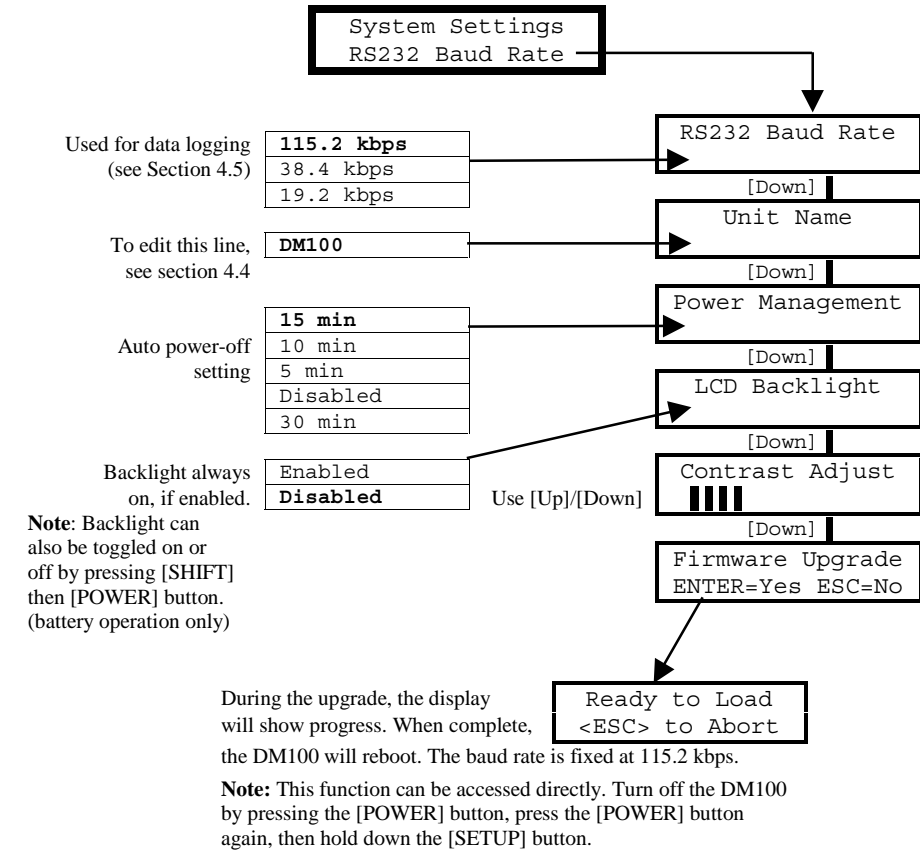
```
┌──────────────────────────┐
│ 01-<name 1>              │
├──────────────────────────┤
│ 02-<name 2>              │
├──────────────────────────┤
│ 03-<name 3>              │
├──────────────────────────┤
│ 04-<name 4>              │
└──────────────────────────┘
```

```
╔══════════════════════════╗
║    Recall Preset         ║
╚══════════════════════════╝
           [Down]
╔══════════════════════════╗
║    Save Preset           ║
╚══════════════════════════╝
```

After selecting preset number using [Up]/[Down] buttons, press [ENTER] to move to the editing screen.

```
┌──────────────────────────┐
│          01              │
├──────────────────────────┤
│          02              │
├──────────────────────────┤
│          03              │
├──────────────────────────┤
│          04              │
└──────────────────────────┘
```

xx is the preset number. Press the [Up] or [Down] buttons to move through the alphabet. Press [ENTER] to select the character and move to next position. Use [ESC] to make any corrections.

```
┌──────────────────────────┐
│    Enter xx Name         │
│         name             │
└──────────────────────────┘
```

After 12 characters (including spaces) have been entered, the preset and name can be saved.

```
┌──────────────────────────┐
│    Save Settings?        │
│  ENTER=Yes ESC=No        │
└──────────────────────────┘
```

4.5   I/O Control

The I/O control menu configures the physical input and output connections of the DM100. **Input Select** allows the user to choose a specific physical input rather than the default of Autodetect. **Gen Clock Source** chooses the reference signal for the generator. If the unit is set to Digital Input but one is unavailable, it will default automatically to the internal 48 kHz clock. **DAC on Non-Audio** controls whether the audio output will mute when the incoming bitstream is flagged as non-audio data. **Optical Output** switches the Toslink optical output on or off. If not required, disable it to extend battery life**.**

Logging Output can be used for long-term data recording. See section 5.1.

```
                         ┌─────────────────────────┐
                         │      I/O Control         │
                         │     Input Select  ───────┼──────────┐
                         └─────────────────────────┘          │
                                                              ▼
┌───────────────────────┐                    ┌─────────────────────────┐
│ **Autodetect**        │                    │      Input Select        │
│ BNC                   │───────────────────▶│                          │
│ XLR                   │                    └─────────────────────────┘
│ Optical               │                            [Down] ▌
└───────────────────────┘                    ┌─────────────────────────┐
                                             │    Gen Clock Source      │
┌───────────────────────┐──────────────────▶│                          │
│ Digital Input         │                    └─────────────────────────┘
│ Video Ref 48 kHz      │                            [Down] ▌
│ **Internal 48 kHz**   │                    ┌─────────────────────────┐
└───────────────────────┘                    │    DAC on Non-Audio      │
                                        ┌───▶│                          │
                                        │    └─────────────────────────┘
┌───────────────────────┐               │            [Down] ▌
│ **Mute**              │───────────────┘    ┌─────────────────────────┐
│ Active                │                    │     Optical Output       │
└───────────────────────┘            ┌──────▶│                          │
┌───────────────────────┐            │       └─────────────────────────┘
│ Enabled               │────────────┤               [Down] ▌
│ **Disabled**          │            │       ┌─────────────────────────┐
└───────────────────────┘            └──────▶│     Logging Output       │
                                             │                          │
                                             └─────────────────────────┘
```

4.6   System Settings

The System Settings menu contains options for setting user preferences for the DM100. **RS-232 Baud Rate** controls the speed of the RS-232 port logging data. **Unit Name** allows entry of up to 12 characters to give a DM100 a unique identity. This is displayed during power on. The **Power Management** function controls how long the unit will remain switched on after the last button press when operating on battery power. **LCD Backlight** and **Contrast Adjust** control aspects of the LCD**. Firmware Upgrade** is used to load new firmware into the DM100.

```
System Settings
RS232 Baud Rate
```

```
RS232 Baud Rate
```
[Down]

Used for data logging (see Section 4.5)
```
115.2 kbps
38.4 kbps
19.2 kbps
```

```
Unit Name
```
[Down]

To edit this line, see section 4.4
```
DM100
```

```
Power Management
```
[Down]

Auto power-off setting
```
15 min
10 min
5 min
Disabled
30 min
```

```
LCD Backlight
```
[Down]

Backlight always on, if enabled.
```
Enabled
Disabled
```
Use [Up]/[Down]

Note: Backlight can also be toggled on or off by pressing [SHIFT] then [POWER] button. (battery operation only)

```
Contrast Adjust
▮▮▮▮
```
[Down]

```
Firmware Upgrade
ENTER=Yes ESC=No
```

During the upgrade, the display will show progress. When complete,
```
Ready to Load
<ESC> to Abort
```
the DM100 will reboot. The baud rate is fixed at 115.2 kbps.

Note: This function can be accessed directly. Turn off the DM100 by pressing the [POWER] button, press the [POWER] button again, then hold down the [SETUP] button.

Note

When powered from the external power supply, the Power Management setting is ignored and the unit remains switched on. The LCD backlight and keypad backlights are also turned on, overriding the LCD Backlight setting.

Chapter 5
Reference Information

5.1 Data Transfer

Connect the RS-232 port on the front of the DM100 to a computer using the cable provided. The RS-232 serial interface is used for:

- Test bitstream loading.

- Data logging. Status information can be transferred from the DM100 via a terminal program. The status information is transmitted in the form of text messages that can be read on the terminal display.

- Firmware upgrades.

Test Bitstream Loading

Test bitstream loading is accomplished using the Gen Control setup menu. Press the [SETUP] button, then use the [down] button to step to the Gen Control menu. See section 4.2. The table at the end of this section lists possible error messages.

Data Logging

This function can be used for long-term data recording. Any standard terminal program may be used on the computer. The logged data is the in the form: time, parameter, and value. The logged time is the elapsed time since the DM100 was last switched on. A fixed set of parameters is always logged (input format, errors, etc.). One additional parameter may be logged by navigating to the status screen that contains that parameter. First, set the baud rate you wish to use via the System Settings menu: Press the [SETUP] button, then use the [Down] button to step to the System Settings menu. Press [ENTER] and select the desired baud rate with the [Up/Down] buttons. Press [ENTER] to save. Next, to initiate logging: Press the [SETUP] button again, then use the [down] button to step to the I/O Control menu. Press

[ENTER], then use the [down] button to step to Logging Output. Press [ENTER] then use the [down] button to select Enable. Press [ENTER] to start logging via the RS-232 connection to your terminal program. See sections 4.5 and 4.6.

Firmware Upgrade

With the DM100 powered off, press the [Power] button, then hold down the [Setup] button. The DM100 will display the Firmware Upgrade screen. The data transfer operates at a fixed baud rate of 115.2 kbps. If an error occurs during the upgrade, the Error LED will illuminate, an error message will be displayed, and the data transfer will halt.

Pressing the [ESC] button exits the upgrade mode if data is not being transferred, or turns the unit off if a data transfer error occurs.

Data Transfer Error Messages

Error Message Display	Description
HDR CHKSUM ERR	Invalid checksum in file's header
HDR LENGTH ERR	Invalid length in file's header
DATA CHKSUM ERR	Invalid checksum in data portion of file
DATA LENGTH ERR	Invalid data length specified in file's header
FLASH INIT ERR	Flash memory detection failed - device code not recognized
FLASH ERASE ERR	Flash sector protected and can not be erased
FLASH PGM ERR XX AT ADDR YYYYYY	Flash not blank at address YYYYYY (hex). Flash module error code given in XX (hex).
IMAGE SIZE ERR	Error in downloaded image size or address - either too large for RAM or too large for flash.
VERIFY ERR	Programmed image in flash does not match downloaded image after programming.
PRODUCT ERR	Product code in file's header is not "DM100"
FLASH MEM FULL	No space left in flash memory (when loading test bitstreams)
TOO MANY STREAMS	There is a limit of 200 streams in the unit.

5.2 Unit Reset

Restore Default Settings

With the DM100 powered off, press [POWER], then hold down the [ENTER] button. The factory default settings are restored without changing your presets or stored test bitstreams.

Hardware Reset

In the unlikely event that the restore procedure above does not work, the unit can also be reset by inserting a pen or paper clip into the **RESET** hole on the back of the DM100. The unit will reset and power off.
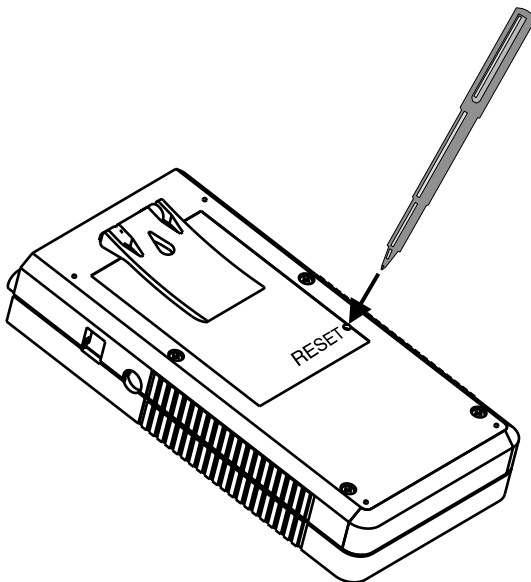
5.3   Connector Pinout Information

5.3.1   RS-232 Serial Port

Pin	Function	Description
1	NC	
2	NC	
3	TX	asynchronous data out
4	Ground	
5	RX	asynchronous data in
6	NC	
7	NC	
8	NC	

8-Position
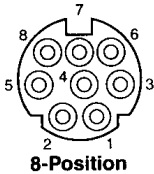
5.3.2   XLR Connectors

Pin	Connection
1	Signal Ground
2	Signal +
3	Signal -

5.3.3   Headphone Connector

Pin	Connection
Tip	Left Channel
Ring	Right Channel
Sleeve	Common

5.4   DM100 Specifications

Sampling Rates
48 kHz for all modes,
32 kHz and 44.1 kHz for Dolby Digital
and PCM

Video Frame Rates
29.97 and 25 fps

Frequency Response
Digital Outputs: 20 Hz–20 kHz, ±0.25 dB

Distortion
<0.01% at 1 kHz
<0.02%, 20 Hz–20 kHz

Dynamic Range
>100 dB

Digital Audio Inputs
AES/EBU via XLR female connector,
110Ω.
AES3ID-1995/SMPTE 276M
via BNC connector, 75Ω.
Fiber optic via Toslink connector.
Input word lengths up to 24 bits.
Supported digital bitstreams:
16- and 32-bit Dolby Digital,
Consumer Dolby Digital,
16-, 20-, and 24-bit Dolby E,
Non-audio AES3.

Reference Video Input
Analog composite NTSC or PAL black
burst video reference, 1V p-p, via RCA
connector, 75Ω internally terminated.

Digital Audio Outputs
AES/EBU via XLR female connector,
110Ω.
AES3ID-1995/SMPTE 276M
via BNC connector, 75Ω.
Fiber optic via Toslink connector.
Output word lengths up to 24 bits

Serial Input/Output Port
8-pin female mini DIN, RS-232

Headphone Output
+5.8 dBu max (adjustable) into 600Ω,
1/8-inch standard stereo headphone jack

Case
ABS plastic hand-held enclosure

Dimensions and Weight
$100 \times 200 \times 41$mm
$(4 \times 7.9 \times 1.6$ inches)
Net 0.68 kg (1.5 lb)

Environmental Conditions
Operating: 0° to 50°C (32° to 122°F),
0–98% relative humidity (non-
condensing)
Non-operating: –20° to +70°C
(–68° to +158°F)

Power Requirements
External 6 VDC, 800 mA
or four internal 1.5 V AA batteries
Typical battery life 4 hours, continuous
use

Supplied Accessories
User's manual
Warranty card
Carrying case
Batteries
External DC power adapter
BNC (F)-to-RCA (M) adapter for video
reference input,
RCA (F)-to-BNC (M) adapters for the
two audio inputs,
RS-232 serial data cable

Regulatory Notices
North America: This unit complies with
the limits for a Class A digital device,
pursuant to Part 15 of the FCC rules, and
Industry Canada ICES-003 regulations.
Europe: This unit complies with the
requirements of EMC Directive
89/336/EEC.

5.5   System Block Diagram